



April 7, 2006.

The National Organic Standards Board
c/o Valerie Francis
Room 408 – South Building
1400 & Independence Avenue, SW
Washington, D.C. 20250-0001

Re: NOSB Aquaculture Working Group Interim Final Report

Dear Ms. Frances:

I am an Extension Aquaculture Specialist and part of the Extension Faculty of the Department of Animal Science at the University of California, Davis. I am also a contributor to the NOAWG white paper. My primary contribution to the paper is in the area of aquatic animal welfare. My input was requested by the committee based on 14-years experience working with the California Farm Bureau Federation, Animal Health and Welfare Committee, and my university programs of assistance to the aquaculture industry in addressing aquaculture and welfare issues. Thank you for this opportunity to provide comments concerning the Aquaculture Working Group Interim Final Report.

I am a supporter of efforts to develop a strong U.S. position and national standards for organic aquaculture products. California has made a decision to preclude development of state organic standards for aquaculture based on knowledge that national standards are being considered. I feel that it is essential that there be continuity in standards between states to foster integrity in a unified position with regard to definitions and expectations surrounding organic standards. It is essential to national aquaculture markets.

I also feel that there should be continuity between U.S. standards and those already established in the international marketplace. I was especially impressed with the committee's efforts in their review of existing organic standards internationally and their effort to find common objectives in the development of the standards in the Interim Final Report. While it is critical to develop a strong U.S. program that addresses national organic standards for aquaculture, it is equally critical that these standards receive the recognition of the international community so that our aquaculture export products are readily recognized as organic products in offshore markets. While I recognize the desire of segments of the aquaculture industry to obtain full certification as organic producers, I also recognize the necessity of maintaining the conceptual integrity of an organic effort at the national level. The label of certified organic product must have a strong U.S. identification, and meet aquaculture's need to move product within both domestic and in international markets. I feel that the structure and content of the interim document meets these needs.

I have read the Interim Final Report and feel that it is a well constructed document. It provides a clear understanding of the requirements for organic certification of aquatic products, and I fully support its continuation through the process necessary for final adoption.

In support of this major objective, I am also providing the following comments which summarize contemporary reviews on the question of pain and suffering of fish and the relationship to humane slaughter. Since 2000, three reviews have been published by a cadre of scientists working in the fields of fish physiology and associated biology, and covered referred journal papers in fish neural physiology and anatomy, pharmacology, behavior and stress physiology. The more recent reviews were in response to a single referred journal review published in 1999 that stated that fish were incapable of pain because of the lack of a neocortex, which is based on the mammalian model and the human brain.

In summary, the reviews state that there is a strong alternative view that fish are more complex animals with sophisticated behaviour than previously thought, and probably have the capacity for suffering. Because we do not communicate directly with animals, determining what an animal (fish) feels is based on indirect measurements. Although the nocuous stimulation may be perceived by the fish differently than from the human experience, the effects and behavior response are similar. There also may be a greater degree of homology between the forebrain of fish and mammals and even if this is not the case, we know that the same job can be done by different parts of the brain in different kinds of animals. Recent empirical studies support this alternative view and show that painful stimuli are, at least, strongly aversive to fish. There is growing evidence that fish can experience fear-like states and that they avoid situations in which they have experienced adverse conditions. The scientists conclude that there is evidence of fish species with sophisticated cognitive and behavioural processes, the experience of suffering may be a real possibility.

Based on the body of scientific evidence, the aquaculture industry in the U.S. is becoming more aware of issues relative to aquatic animal welfare and recommended practices of humane slaughter, which requires an animal to be unconscious before slaughter. The recommendations presented in the Interim Final Report are consistent with this philosophy. The recommended methods of slaughter of percussive and electrical stunning contained in the report are already developed for salmonids, and are being employed in Scotland, Norway, Western Europe, and Canada. Electric stunning of channel catfish has been employed by the channel catfish industry in the southeastern U.S. for a number of years. These are transferable technologies, and are available from areas where they are now employed. The Interim Final Report also has provisions for a technical developmental period in which technical difficulties may be overcome while employing a lesser standard.

I highly recommend acceptance of the AWG Interim Final Report.



Fred S. Conte
Aquaculture Specialist